

---

**EXHIBIT I**

---

(12) **United States Patent**  
**Ikoma et al.**

(10) **Patent No.:** **US 7,709,900 B2**  
(45) **Date of Patent:** **\*May 4, 2010**

(54) **SEMICONDUCTOR DEVICE**  
(75) Inventors: **Daisaku Ikoma**, Osaka (JP); **Atsuhiko Kajiya**, Hyogo (JP); **Katsuhiko Ootani**, Nara (JP); **Kyoji Yamashita**, Kyoto (JP)

5,438,214 A 8/1995 Egawa et al.  
5,498,897 A 3/1996 Komatsuzaki et al.  
5,847,421 A 12/1998 Yamaguchi

(Continued)

(73) Assignee: **Panasonic Corporation**, Osaka (JP)  
(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 121 days.

FOREIGN PATENT DOCUMENTS

JP 64-50443 2/1989

(Continued)

This patent is subject to a terminal disclaimer.

OTHER PUBLICATIONS

Japanese Office Action, with English translation, issued in Japanese Patent Application No. JP 2004-213903, mailed Apr. 1, 2008.

(Continued)

(21) Appl. No.: **11/892,053**

(22) Filed: **Aug. 20, 2007**

(65) **Prior Publication Data**  
US 2008/0042214 A1 Feb. 21, 2008

Primary Examiner—Phat X Cao  
(74) Attorney, Agent, or Firm—McDermott Will & Emery LLP

**Related U.S. Application Data**

(62) Division of application No. 11/148,208, filed on Jun. 9, 2005, now Pat. No. 7,279,727.

(57) **ABSTRACT**

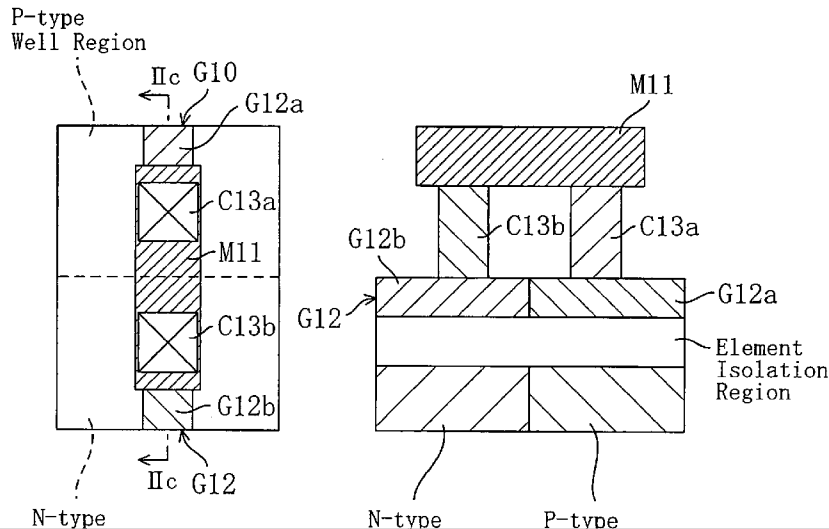
A semiconductor device includes a semiconductor substrate; a diffusion region which is formed in the semiconductor substrate and serves as a region for the formation of a MIS transistor; an element isolation region surrounding the diffusion region; at least one gate conductor film which is formed across the diffusion region and the element isolation region, includes a gate electrode part located on the diffusion region and a gate interconnect part located on the element isolation region, and has a constant dimension in the gate length direction; and an interlayer insulating film covering the gate electrode. The semiconductor device further includes a gate contact which passes through the interlayer insulating film, is connected to the gate interconnect part, and has the dimension in the gate length direction larger than the gate interconnect part.

(30) **Foreign Application Priority Data**  
Jul. 22, 2004 (JP) ..... 2004-213903

(51) **Int. Cl.**  
**H01L 23/62** (2006.01)  
(52) **U.S. Cl.** ..... **257/369; 257/371; 257/E27.064**  
(58) **Field of Classification Search** ..... **257/369; 257/371, E27.064**  
See application file for complete search history.

(56) **References Cited**  
U.S. PATENT DOCUMENTS  
5,420,447 A 5/1995 Waggoner

**10 Claims, 7 Drawing Sheets**



**US 7,709,900 B2**

Page 2

U.S. PATENT DOCUMENTS

6,222,758	B1	4/2001	Higashide	
6,376,351	B1 *	4/2002	Tsai	438/592
7,279,727	B2 *	10/2007	Ikoma et al.	257/204
7,405,450	B2 *	7/2008	Lyu et al.	257/388
2007/0063288	A1	3/2007	Furuta et al.	

JP	9-246541	9/1997
JP	10-032253	2/1998
JP	11-297850	10/1999
JP	2001-127158	5/2001
JP	2002-026125 A	1/2002
JP	2003-218117	7/2003

FOREIGN PATENT DOCUMENTS

JP	64-89468	4/1989
JP	05-006965	1/1993
JP	08-272075	10/1996

OTHER PUBLICATIONS

Chinese Office Action, with English Translation, issued in Chinese Patent Application No. CN 200510085984.9, issued on Apr. 14, 2008.

\* cited by examiner

FIG. 1B

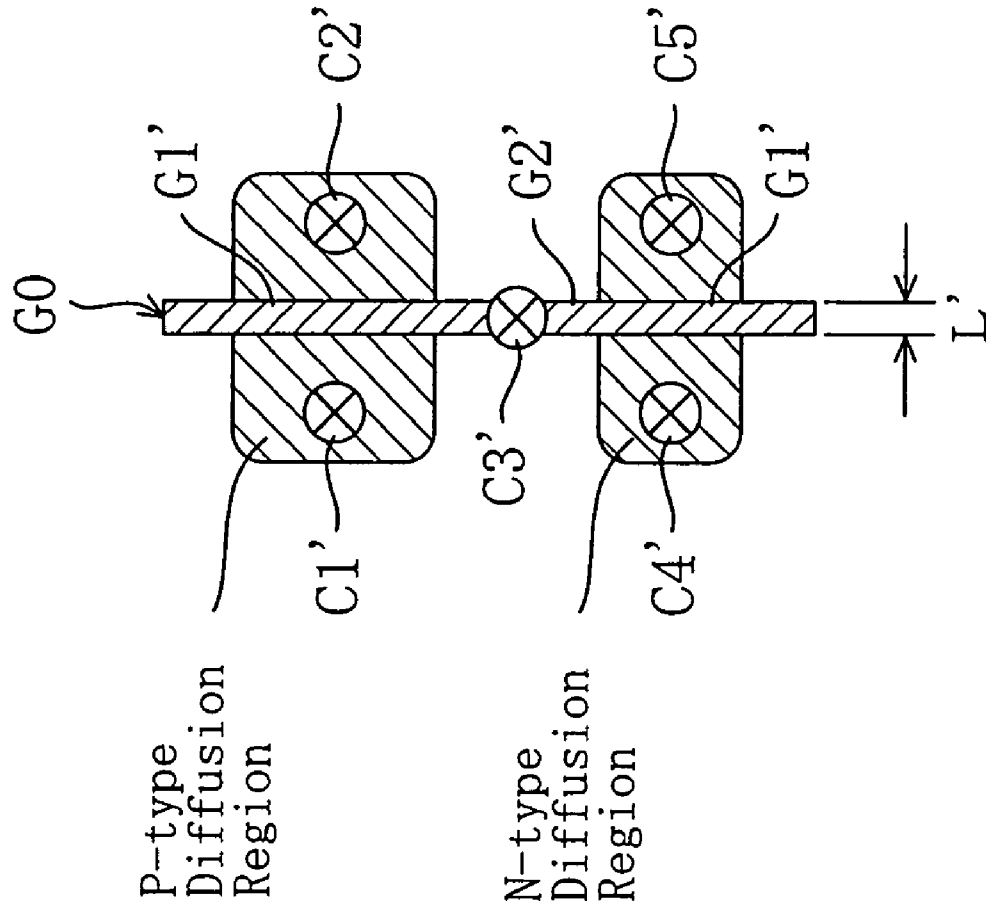
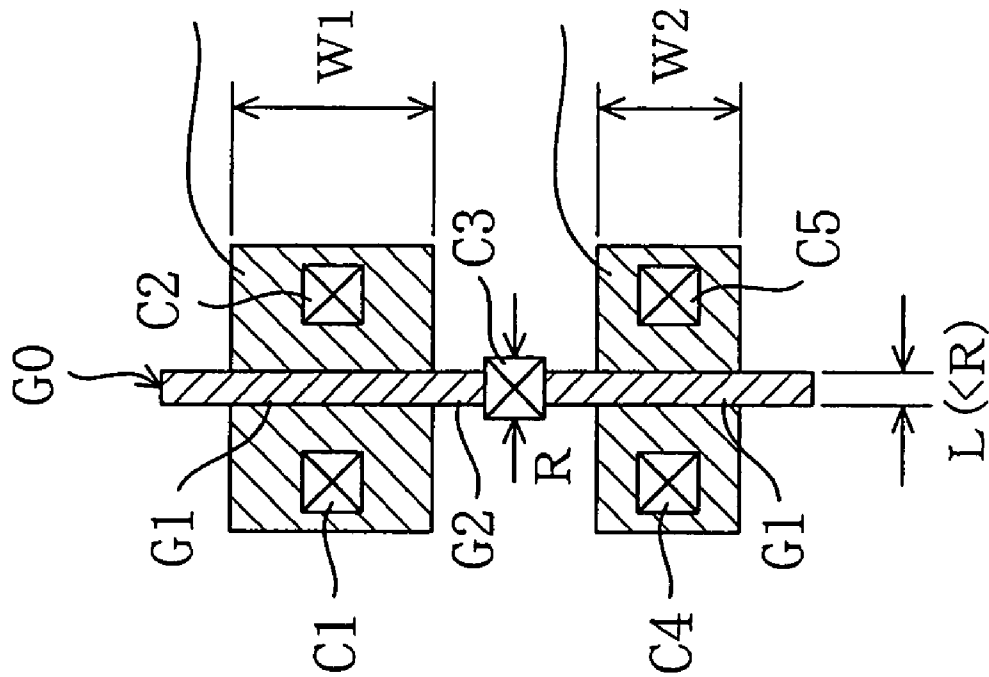
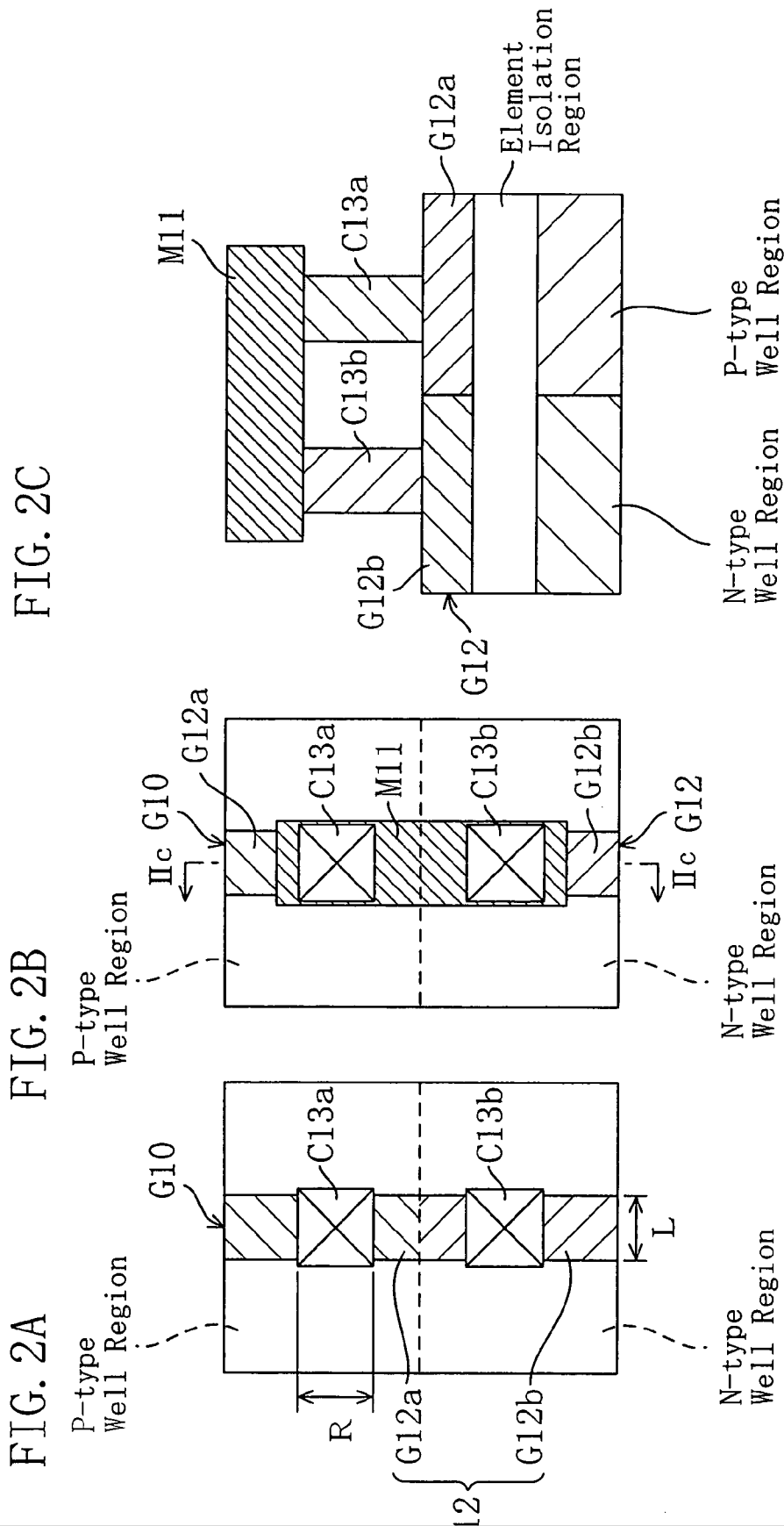


FIG. 1A





# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.